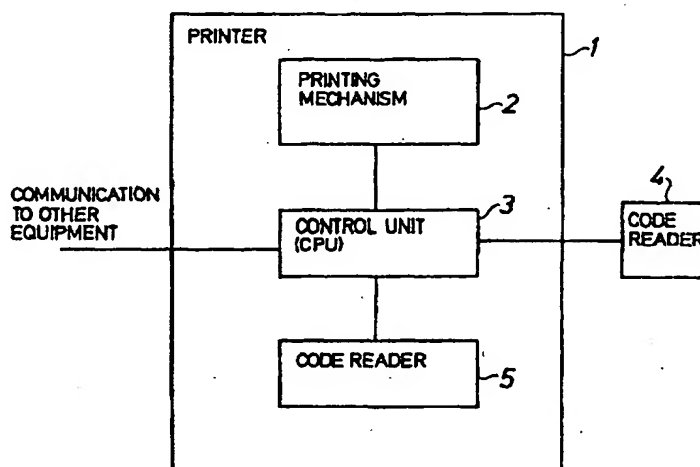




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B41J 29/393, 29/38	A1	(11) International Publication Number: WO 98/05508 (43) International Publication Date: 12 February 1998 (12.02.98)
(21) International Application Number: PCT/SE97/01322 (22) International Filing Date: 4 August 1997 (04.08.97) (30) Priority Data: 9602934-3 7 August 1996 (07.08.96) SE (71) Applicant (for all designated States except US): UBI PTC AB [SE/SE]; P.O. Box 123, S-431 22 Mölndal (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): GUNNARSSON, Mats [SE/SE]; Hemmenköp 1, S-242 96 Hörby (SE). (74) Agents: ÅKERMAN, Mårten, L. et al.; Albiñ Holmqvist AB, P.O. Box 4289, S-203 14 Malmö (SE).	(81) Designated States: CN, JP, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. In English translation (filed in Swedish).	

(54) Title: ARRANGEMENT FOR AUTOMATIC SETTING OF PRINTERS AND MATERIALS THEREFOR



(57) Abstract

The invention concerns an arrangement for the automatic setting of printers, and more particularly the setting of printer parameters by means of code reading, and materials therefor. The parameters concern the printer work parameters, data communication, or printing layout. The code to be read may be applied directly onto the material to be used in the printer, or on separate sheets or labels. With the invention, an optimum setting of the printer (1) is automatically achieved, entailing high quality and making the printer easily usable also by unqualified personnel. The arrangement comprises a printing mechanism (2) and a control unit (3) for achieving a print-out on a printing material by means of a dye. According to the invention, a code reader (4, 5) is connected to the control unit (3) for reading a code for controlling at least one parameter of the printer means. The code may alternatively be associated with the receiver material, the dye, a peripheral device of the printer means, or a printing layout.

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5 TITLE OF INVENTION: ARRANGEMENT FOR AUTOMATIC SETTING OF
PRINTERS AND MATERIALS THEREFOR

Field of the invention

10 This invention relates to an arrangement for the automatic setting of print-
ers, and more particularly to the setting of printer parameters by means of code
reading. The parameters concern the printer work parameters, data communication
or printing layout. The code to be read may be affixed directly onto material to be
used in the printer, or onto separate sheets or labels. This invention also relates to
15 materials, i.e. printing materials and dyes, to be used together with a printer. With
the aid of the present invention, an optimum setting of the printer is automatically
obtained, entailing a high quality and making the printer easily usable also for
unqualified staff members.

20 State of the art

In the prior art, the setting of the printer was performed by entering param-
eters using a keyboard in connection to the printer, or by data transfer. There are,
however, many parameters to be entered, and the parameter theory is rather
complicated, implying that frequently the user may not be able to perform a
25 correct printer setting himself. Furthermore, some parameters are factory set and
can only be changed by a qualified service technician. This of course means that
the quality of the printed product will be less than optimal.

Within other technical areas, coding has been used for the setting of various
devices. As an example, programming of video recorders with the aid of bar
30 codes, setting of cameras by reading codes on film cartridges, setting of audio tape
recorders by sensing cavities on the tapes, etc. It is not known, however, to control
a printer by codes in the way that the present invention teaches.

The present invention resolves the problem of setting the printer by affixing
a code onto, or in connection with, materials to be used together with the printer.
35 The code may be read automatically or through a simple manipulation performed
by the printer user.

Owing to the invention, an optimum setting of the printer is achieved fully
automatically or semi-automatically. This means that a high print-out quality can
be warranted. The invention allows for quick and easy exchange of dye and
40 receiver material with an automatic or semi-automatic optimal setting of the

printer work parameters with regard to the dye as well as to the receiver material. Furthermore, other printer functions, such as data communication with peripheral equipment, and printing layout, can be controlled in a simple manner.

5 Summary of the invention

The present invention thus provides an arrangement for the automatic setting of a printer means. The arrangement includes a printing mechanism and a control unit for providing a print-out on a printing material with the aid of a dye. In accordance with the invention, a code reader is connected to the control unit for
10 reading a code for controlling at least one parameter of the printer means. Alternatively, the code may be associated with the printing material, the dye, a printer means peripheral device, or a printing layout.

The present invention also provides materials intended for use together with such an arrangement.

15 Various detailed embodiment forms of the invention will be described in the accompanying claims.

Brief description of the drawings

The invention will be described in detail below, with reference to the
20 drawings, in which:

- Fig. 1 is a block diagram showing the arrangement according to the invention;
- Fig. 2 shows an example of a code;
- Fig. 3 illustrates a material onto which a code has been applied in accordance with an embodiment of the invention;
- Fig. 4 illustrates a material onto which a code has been applied in accordance with another embodiment of the invention; and
- Fig. 5 illustrates a core of a roll of material, onto which a code has been applied in accordance with a further embodiment of the invention;

Detailed description of preferred embodiments

The invention will initially be described in detail with reference to a preferred embodiment of the invention, as illustrated in the drawings. The principle
25 may be applied in various ways, as stated below.

The printer 1 comprises a printing mechanism 2, performing the actual printing. In the embodiment example shown, the printing mechanism is of the thermo-transfer type, i.e. the printing mechanism includes a printing head having
30 heated points or dots (not shown). The dots act on a heat-sensitive dye or transfer ribbon which transfers dye to a receiver material, normally paper, but synthetic materials are also commonly used. The paper may be a single layer or comprise of

a carrier or back paper carrying labels or tickets to be printed. The receiver material may come in the form of a roll, loose sheets, or a continuous web. The transfer ribbon is delivered as a roll which is fitted into the machine and wound past the printer head. Printing mechanisms of this type are well known in the trade and do not, as such, constitute any part of the invention.

In order to achieve an optimum print-out result, it is of utmost importance that the transfer ribbon dye, the receiver material, the temperature of the dots and the printing speed, are correctly adapted to each other. The wrong materials and erroneous printer settings are, regrettably, often one of the most common causes of a bad or unsuccessful printing result. A correct printer setting and a correctly chosen printing material will also prevent overheating, which might otherwise easily cause damage to the printer head, leading to a premature exchange thereof. A universal ribbon having an optimal print-out quality, and fitting all printers, is impossible to develop.

For the thermo-transfer technology it is especially important that the transfer ribbon and the receiver material are adapted to each other.

Thus, the various parameters of the printing mechanism must be correctly set. The printing mechanism is controlled by a control unit 3 (CPU), which may be microprocessor based. In order to feed the correct parameters to the control unit in accordance with the present invention, a code reader is used. The code reader may be external 4, and be complemented by an internal code reader 5, or vice versa, as will be explained below. The code reader reads a code, in the discussed example illustrated by a bar code 6 (Fig. 2), which is provided in connection with the transfer ribbon and the receiver material.

In the possibly most user-friendly version of the invention, the code is pre-printed or affixed directly onto the start end of the dye ribbon roll and the roll of receiver material. When such rolls, respectively, are fitted into the printer, the internal code reader is utilised, reading the code at the beginning of the roll, before any print-out has been performed. Thereby, the printer is immediately set for optimum printing quality.

An alternative to this, is the code being pre-printed or pre-manufactured on a label, which is glued onto the roll for reading. This may be useful when having dye ribbons or paper of a known quality, but without a pre-printed code. There might be a large stock of older paper that one might want to use, or it might for some reason become necessary to change dye ribbon or paper in the middle of a roll.

In the above case, only the internal code reader 5 was used. The printer according to the invention however preferably includes also an external code reader 4, that may completely replace the internal code reader, e.g. if wanting to modernise an existing printer without a code reader. The external code reader 4

may be used for reading from e.g. separate sheets comprising codes for various possible paper and dye ribbon qualities. A printer manufacturer could for example enclose such a separate sheet with many different codes listing dye ribbon and printing material data from different manufacturers, in order to make his printer flexible and not to be confined to certain manufacturers. The materials manufacturer obtains the same advantage of increased flexibility, as his material will not be confined to a certain printer.

Another suitable location for affixing the code may be on a material packing. This is especially preferable when the printing material comes in sheets rather than on a roll, and when the dye consists of ink or dye powder that is not suitable in itself to carry the code. The code may in this case be read either internally, if the package or a part thereof is fed into the reader, or be read by the external code reader.

In Fig. 2, a bar code is shown. The advantage of the bar code is that a reliable reading is quickly and simply available. There are already a number of standards for the writing and reading of bar codes. Other optical codes are of course also possible, e.g. two-dimensional codes, colour codes, dot codes, matrix codes, etc.

Also magnetic codes and magnetic code readers are suitable for the present invention. The magnetic code may be applied directly onto the material in question, or onto a label in the same manner as the above described bar code. The magnetic code may also be provided on a plastic card and be read by an internal or external slot reader.

The code may also be provided in the form of a conductive metal layer for electronic reading. The metal layers might preferably be arranged on the packaging for internal reading; compare film cartridges in minicameras.

Codes may also be read electronically by means of RF tags or RF labels. These consist of metal layers constituting electronic components. When subjected to a radio frequency magnetic field, caused by the code reader, they answer with a frequency comprising the code.

Fig. 3 shows an embodiment of the arrangement according to the invention, where an RF tag 7 is positioned at the beginning of a roll of material 8, i.e. at the exterior end 9 of the roll. The RF tag is read automatically by an integrated RF code reader.

As shown in Fig. 4, an RF tag 10 may alternatively be positioned at the inner end 14 of the roll, i.e. adjacent the core 11, or support, upon which the material has been wound. As the reading is electronic, reading through the material can be performed without problems. One advantage with this location is that the RF tag 10 is completely protected and there is no risk of it accidentally falling off or being torn off.

A further variant is to place an RF tag 12 directly on the outside of the core before winding the material on, or an RF tag 13 on the inside of the core 11. The RF tag can be placed on the inside also when the material has already been wound onto the core.

5 It is also possible to use a mechanical reading, by arms being placed in different positions by means of protrusions and recesses provided on a dye powder cartridge or similar.

The invention may also be applied to other types of printers. Direct thermo-
10 printers function in a similar manner to thermo-transfer printers but utilise no transfer ribbon. Instead, the printing head is allowed to apply heat directly onto a heat-sensitive paper.

Ink jet and laser printers use ink and carbon powder, respectively, as dye, which is supplied in cartridges. The printers may need adjustment for writing on special materials, e.g. metal and plastic resins. Codes may be easily applied e.g. on
15 the ink or carbon powder package, as mentioned above.

There are commercially available readers of different types that can be used with the present invention. The most common types are contact readers, e.g. bar code pens, or distance readers, e.g. CCD readers and laser scanners, which may be fixed or hand held, and slot readers, being common with plastic cards but also
20 usable for bar codes. The external reader may be mounted on a stand, or be fixed in the form of an eye on the side of the printer, for reading by sliding the code past the eye at a suitable distance. The readers as such do not constitute any part of the present invention.

In the embodiment described above, the printer has been set mainly with
25 regard to the print-out quality. However, the invention is not intended to be limited to this only, but the reading may also be used for controlling the data communication between the printer and its peripheral equipment, such as baud rate and number of bits, and printing layouts. For a printer which is to print labels in various standard formats and with varying texts, the printing can thus be controlled
30 by a simple reading of a code from a "ready-reckoner", best done using the external reader 4. The code constitutes a command to the control unit or to an external computer, controlling the printing layout.

The person skilled in the art will realise that the invention may be embodied with many different types of printing mechanisms, codes, code readers and control
35 units. The invention will only be limited by the following patent claims.

CLAIMS

1. An arrangement for the automatic setting of a printer means (1), comprising a printing mechanism (2) and a control unit (3) for providing a print-out on a printing material by means of a dye, **characterised by** a code reader (4, 5), being
5 connected to the control unit (3) for reading a code for controlling at least one parameter of the printer means.
2. Arrangement according to claim 1, **characterised in that** the code is associated with the printing material, the dye, or a peripheral device of the printer
10 means (1), or with a printing layout.
3. Arrangement according to any one of claims 1 or 2, **characterised in that** the code reader (4, 5) is an optical reader.
- 15 4. Arrangement according to claim 3, **characterised in that** the code is a bar code, dot code, matrix code or a colour code.
5. Arrangement according to any one of claims 1 or 2, **characterised in that** the code reader (4, 5) is a magnetic reader and that the code is a magnetic code.
20
6. Arrangement according to any one of claims 1 or 2, **characterised in that** the code reader (4, 5) is an electronic unit and that the code is electronically readable.
- 25 7. Arrangement according to claim 6, **characterised in that** the code reader (4, 5) is arranged to sense RF tags or RF labels.
8. Arrangement according to any one of the previous claims, **characterised in that** the code reader (5) is integrated into the printer means.
30
9. Arrangement according to any one of the previous claims, **characterised in that** the printer means comprises an external code reader (4).
10. Arrangement according to any one of the previous claims, **characterised in that** the code is provided on a printing material or dye packing.
35
11. Arrangement according to any one of the previous claims, **characterised in that** the code is provided on a dye roll.

12. Arrangement according to any one of the previous claims, **characterised in that** the code is provided on the printing material.
13. Arrangement according to any one of the previous claims, **characterised in that** the printing material is a roll or a continuous web.
14. Arrangement according to any one of the previous claims, **characterised in that** the code is provided on a separate sheet.
15. Arrangement according to any one of the previous claims, **characterised in that** the code is applied to a label.
16. Arrangement according to any one of the previous claims, **characterised in that** the code is provided on a plastic card.
17. Arrangement according to any one of the previous claims, **characterised in that** the code controls the data communication of the printer means, e.g. the baud rate, or the number of bits, or the work settings of the printer means, e.g. a printer head temperature setting.
18. Arrangement according to any one of the previous claims, **characterised in that** the code constitutes a command for influencing the printing layout of the printer means.
19. Arrangement according to any one of the previous claims, **characterised in that** the code constitutes a command to an external computer.
20. Material for an arrangement for the automatic setting of a printer means (1), comprising a printing mechanism (2) and a control unit (3) for providing a print-out on a printing material by means of a dye, **characterised in that** a code for controlling at least one parameter of the printer means is applied to the material.
21. Material according to claim 20, **characterised in that** the code is printed directly onto the material or onto a label affixed to the material.
22. Material according to claim 20, **characterised in that** the code is printed onto a material packing.
23. Material according to claim 20, **characterised in that** the code is affixed to or baked into the material in the form of metal layers.

24. Material according to claim 20, **characterised in that** the code is provided in the shape of an RF tag (7) attached to the exterior end (9) of a roll of material (8).
- 5 25. Material according to claim 20, **characterised in that** the code is provided in the form of an RF tag applied to the inner end (14) of a roll of material (8).
- 10 26. Material according to claim 20, **characterised in that** the code is provided in the form of an RF tag applied on the outside (12) or the inside (13) of a core (11) of a roll of material.

1/2

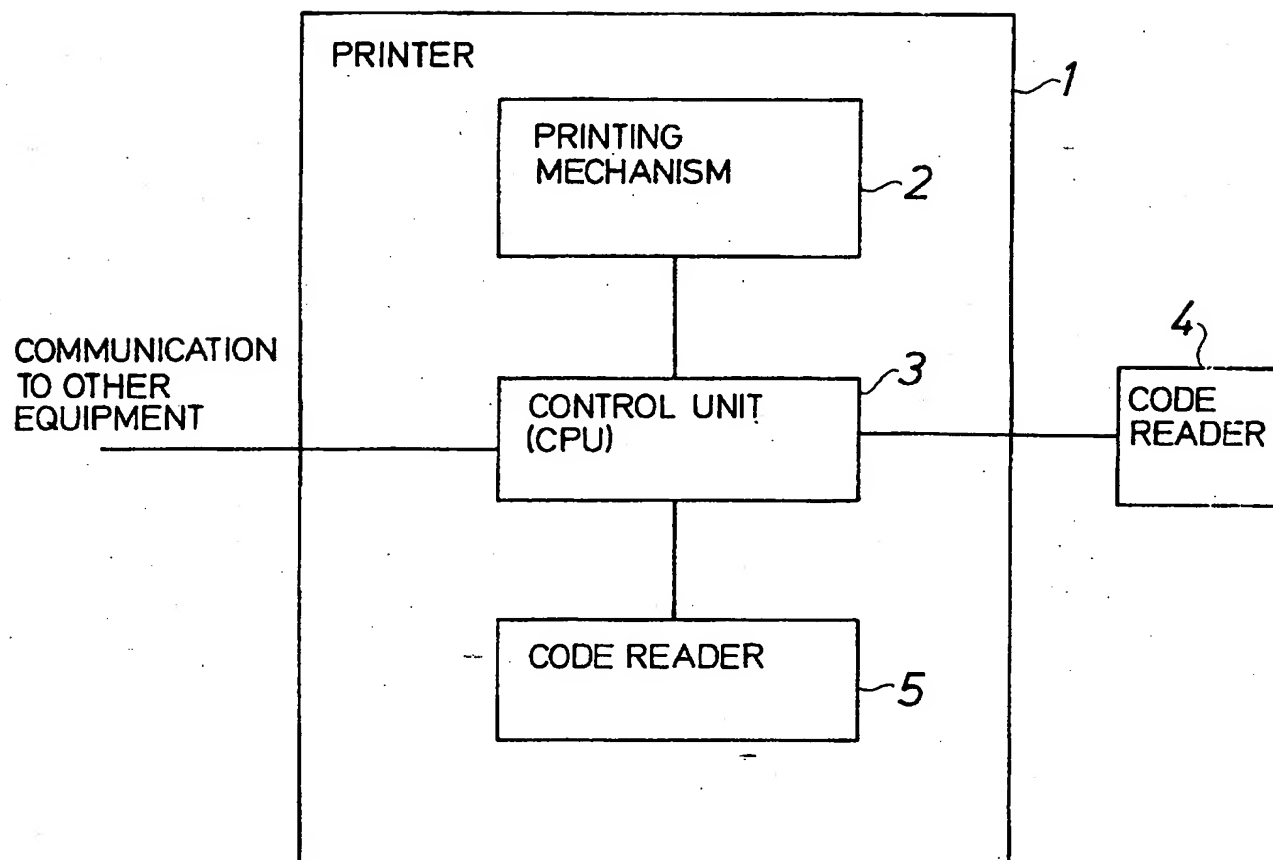


FIG. 1



FIG. 2

SUBSTITUTE SHEET

2/2

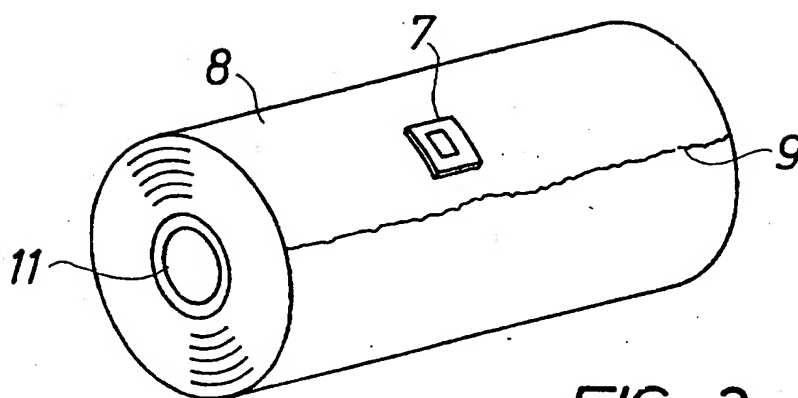


FIG. 3

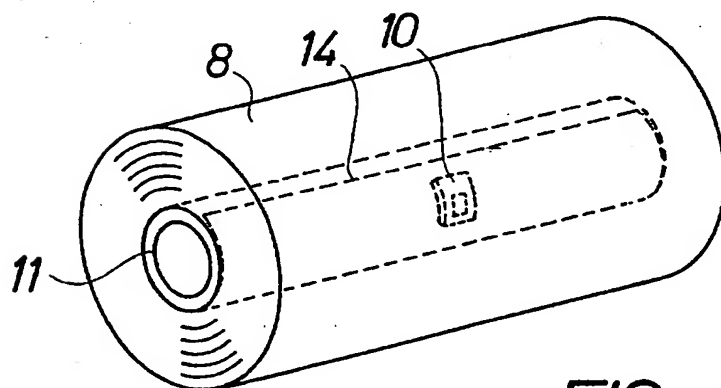


FIG. 4

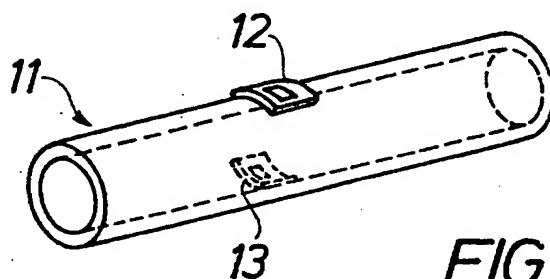


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 97/01322

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B41J 29/393, B41J 29/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B41J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPIL, EDOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5534890 A (KRUG ET AL), 9 July 1996 (09.07.96), abstract, column 3, line 14 - line 22, column 3, line 33 - line 36, column 3, line 49 - line 67, column 4, line 14 - line 22, figure 2	1-4, 8, 10-13, 15, 17, 18, 20-22
Y	column 3, line 14 - column 4, line 62, figure 2, abstract	5-7, 9, 24-26
	--	
X	GB 2180823 A (GERBER SCIENTIFIC PRODUCTS INC), 8 April 1987 (08.04.87), page 4, line 35 - line 40, figure 1, abstract	14, 19
A		1-13, 15-18, 20-26
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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

11 November 1997

Date of mailing of the international search report

18 -11- 1997

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International application No.

PCT/SE 97/01322

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4369361 A (SWARTZ ET AL), 18 January 1983 (18.01.83), column 5, line 14 - line 37, figure 7, abstract ---	1,2,3,4,9
Y	US 5280159 A (SCHULTZ ET AL), 18 January 1994 (18.01.94), column 3, line 34 - line 48, figure 1, claims 1-3,12-14, abstract ---	5-7,9
Y	Derwent Info., RD-340076 A, (ANON) ANONYMOUS: " Shri nk-wrapped film covered textile tube (s) - include alphanumeric, bar=code, electronic or coloured identification means in, on, or under film -----	24-26

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/10/97

International application No.

PCT/SE 97/01322

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5534890 A	09/07/96	AT 135304 T DE 4220003 A DE 59301850 D EP 0575773 A,B SE 0575773 T3 ES 2083794 T JP 6055750 A	15/03/96 23/12/93 00/00/00 29/12/93 16/04/96 01/03/94
GB 2180823 A	08/04/87	DE 3631937 A,C FR 2587820 A,B JP 1932590 C JP 6059952 B JP 62093162 A US 4708901 A US 4768410 A	02/04/87 27/03/87 26/05/95 10/08/94 28/04/87 24/11/87 06/09/88
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US 5280159 A	18/01/94	US 5216233 A	01/06/93